

WHAT IS CLAIMED IS:

Sub 4

1. A sprinkler assembly for receiving a supply of water and directing water therefrom, comprising:

a nozzle housing having a flow path formed therethrough for directing a flow of water received in the sprinkler assembly and a water stream outlet through which water flowing through the flow path exits the sprinkler assembly;

a primary nozzle removably mounted in the stream outlet for distributing water from the sprinkler assembly;

a secondary nozzle provided in the nozzle housing for distributing water from the sprinkler assembly; and

a valve for throttling or shutting off flow to said primary nozzle while allowing water to continue to flow to the secondary nozzle.

2. The sprinkler assembly according to claim 1, wherein the valve can be actuated from the exterior of the nozzle housing.

3. The sprinkler assembly according to claim 1, wherein the valve is a slidable gate having a flow opening and movable between an open position in which the flow opening is aligned with the flow path through the nozzle housing, and a closed position in which the flow path is blocked by the slidable gate.

4. The sprinkler assembly according to claim 3, wherein the closed position of the valve gate blocks the flow path in the nozzle housing upstream of position therein of the primary nozzle.

5. The sprinkler assembly according to claim 3, further comprising a flow throttle controller including a gear, wherein the valve gate includes gear teeth along a side thereof for cooperating with the gear of the flow throttle controller, such that the valve gate is moved between the open position and the closed position by rotating the flow throttle controller.

6. The sprinkler assembly according to claim 5, wherein the flow throttle controller can be actuated from the exterior of the nozzle housing.

7. The sprinkler assembly according to claim 3, further comprising an indicator provided on the nozzle housing for indicating an open or closed state of the valve.

8. A sprinkler assembly for receiving a supply of water and directing water therefrom, comprising:

a nozzle housing having a flow path formed therein for directing a flow of water received in the sprinkler assembly and a water stream outlet through which water flowing through the flow path exits the sprinkler assembly;

a nozzle removably mounted in the stream outlet for distributing water from the sprinkler assembly; and

a sleeve valve disposed in the nozzle housing and around the flow path for throttling or shutting off flow to said nozzle, the sleeve valve having an opening and configured to intersect the flow path just upstream of the nozzle.

9. The sprinkler assembly according to claim 8, wherein the sleeve valve is rotatable at least between a fully opened position in which the

Cont. 5
flow opening is aligned with the flow path to allow unobstructed flow through the nozzle housing, and a closed position in which the flow path is completely blocked by the sleeve valve just upstream of the position of the nozzle therein.

10. The sprinkler assembly according to claim 9, further comprising an indicator provided on the nozzle housing for indicating at least an opened or closed state of the valve.

5
11. The sprinkler assembly according to claim 9, further comprising a flow throttle controller including a gear, wherein the sleeve valve includes gear teeth around a circumference thereof for cooperating with the gear of the flow throttle controller, such that the sleeve valve is moved between the opened position and the closed position by rotating the flow throttle controller.

12. The sprinkler assembly according to claim 11, wherein the flow throttle controller can be actuated from the exterior of the nozzle housing.

13. The sprinkler assembly according to claim 8, wherein the sleeve valve is conically-shaped.

14. A sprinkler assembly for receiving a supply of water and directing water therefrom, comprising:

5
a nozzle housing having a central axis and a flow path formed therein for directing a flow of water received in the sprinkler assembly, the flow path having a main portion extending along the central axis of the nozzle housing

and an angled portion defining a water stream outlet passage through which water flowing through the flow path exits the sprinkler assembly;

a nozzle removably mounted in the outlet passage for distributing water from the sprinkler assembly; and

a sleeve valve disposed in the nozzle housing along the main portion of the flow path for throttling or shutting off flow to said nozzle, the sleeve valve having an opening and configured to intersect the flow path at the junction between the main portion of the flow path and the outlet passage.

15. The sprinkler assembly according to claim 14, wherein the axis of rotation of the sleeve valve is offset from the central axis of the nozzle housing.

16. The sprinkler assembly according to claim 14, wherein the sleeve valve is rotatable at least between an opened position in which the valve opening is aligned with the flow path to allow unobstructed flow through the nozzle housing, and a closed position in which the flow path is completely blocked by the sleeve valve at the junction between the main portion of the flow path and the outlet passage.

17. The sprinkler assembly according to claim 16, further comprising a flow throttle controller including a gear, wherein the sleeve valve includes gear teeth around a circumference thereof for cooperating with the gear of the flow throttle controller, such that the sleeve valve is moved between the open position and the closed position by rotating the flow throttle controller.

18. The sprinkler assembly according to claim 17, further comprising an indicator provided on the nozzle housing for indicating an open or closed state of the valve.

19. The sprinkler assembly according to claim 17, wherein the flow throttle controller can be actuated from the exterior of the nozzle housing.

20. The sprinkler assembly according to claim 19, wherein the flow throttle controller is actuated by a rotatable ring disposed around the nozzle housing, wherein the actuator ring includes gear teeth formed along the inner circumference thereof for cooperating with the gear of the flow throttle controller to rotate the same, whereby water flow through the flow path can be throttled or shut off by rotating the ring.

21. The sprinkler assembly according to claim 20, wherein the gear teeth are formed only along a portion of the inner circumference of the actuator ring.

22. The sprinkler assembly according to claim 21, wherein the gear teeth are formed only along approximately a 40° arc of the inner circumference of the actuator ring.

23. The sprinkler assembly according to claim 22, wherein rotation of the actuator ring through the 40° arc having the gear teeth formed thereon achieves a 120° rotation of the sleeve valve which includes the open position and the closed position of the sleeve valve.

5 *Sub*
Fig 7

24. The sprinkler assembly according to claim 20, wherein the actuator ring further includes retention means formed along the inner circumference thereof to thereby retain the nozzle in the outlet passage, wherein a gap in the retention means is provided at a position along the actuator ring corresponding to the closed position of the sleeve valve, to enable removal and replacement of the nozzle from the outlet passage when the gap is aligned with the nozzle.

5

25. The sprinkler assembly according to claim 24, wherein the actuator ring further includes a second gap in the retention means at a position along the actuator ring corresponding to a position of the sleeve valve in which the valve opening is in an at least partially opened position, so that when the second gap is aligned with the nozzle, removal of the nozzle from the outlet passage is enabled by the pressure exerted by a stream of water flowing through the flow path.

5

26. The sprinkler assembly according to claim 20, wherein the actuator ring forms a barrier to hold the nozzle in the outlet passage, and the actuator ring includes at least one recess formed at a position along the actuator ring corresponding to the closed position of the sleeve valve, to enable removal and replacement of the nozzle from the outlet passage when the recess is aligned with the nozzle.

5

27. The sprinkler assembly according to claim 20, wherein the actuator ring further includes retention means formed along the inner circumference thereof to thereby retain the nozzle in the outlet passage, wherein a gap in the retention means is provided at a position along the actuator ring corresponding to a position of the sleeve valve in which the

valve opening is in an at least partially opened position, so that when the gap is aligned with the nozzle, removal of the nozzle from the outlet passage is enabled by the pressure exerted by a stream of water flowing through the flow path.

Sub
28

28. The sprinkler assembly according to claim 20, wherein the actuator ring further includes at least one of a flow break-up lug and a flow deflection lug formed along the lower edge thereof, which can be rotated into alignment with the nozzle to intercept a flow stream exiting the nozzle.

29. A sprinkler assembly for receiving a supply of water and directing water therefrom, comprising:

a nozzle housing having a flow path formed therein for directing a flow of water received in the sprinkler assembly and a water stream outlet through which water flowing through the flow path exits the sprinkler assembly;

a nozzle removably mounted in the stream outlet for distributing water from the sprinkler assembly; and

a valve assembly disposed in the nozzle housing for throttling or shutting off flow to said nozzle, the valve assembly also serving as a retention mechanism for retaining the nozzle in the nozzle housing.

30. The sprinkler assembly according to claim 29, wherein the valve assembly includes

a valve which is movable at least between a first position in which the flow path is unobstructed and a second position in which the flow path is completely blocked to thereby prevent flow from exiting the nozzle housing through the stream outlet; and

an actuator for controlling the valve and for moving the retention mechanism into and out of alignment with the nozzle, whereby when the retention mechanism is moved out of alignment with the nozzle, the nozzle can be removed from the nozzle housing.

10

31. The sprinkler according to claim 30, wherein the valve is a rotatable sleeve valve provided along the flow path in the nozzle housing.

Sub
A7

32. The sprinkler according to claim 30, wherein the actuator includes a rotatable ring provided on the exterior of the nozzle housing.

33. A rotary driven sprinkler comprising:
a stationary housing sprinkler assembly for receiving a supply of water;

a nozzle housing assembly mounted for rotation on top of the sprinkler housing assembly, the nozzle housing assembly having an axis of rotation;

a nozzle removably mounted in the nozzle housing assembly for distributing a flow of water flowing through the sprinkler; and

a rotatable flow shut off valve for throttling or shutting off the flow to the nozzle and having an axis of rotation which is displaced from the axis of rotation of the nozzle housing assembly.

34. A rotary driven sprinkler comprising:
a stationary housing sprinkler assembly for receiving a supply of water;

a nozzle housing assembly mounted for rotation on top of the sprinkler housing assembly;

Sub 4 a nozzle mounted in the nozzle housing assembly for distributing a flow of water away from the sprinkler; and
a rotatable flow shut off valve mounted in the nozzle housing for throttling or shutting off the flow to the nozzle.

*Add
AK*